

ADVISORY DEPARTMENT
OF THE IMPERIAL COLLEGE OF
TROPICAL AGRICULTURE.



R E P O R T

ON THE

AGRICULTURAL DEPARTMENT

DOMINICA.

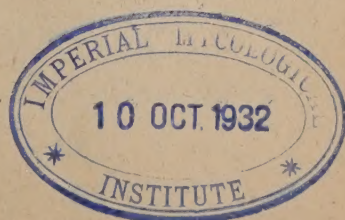
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STAFF OF THE AGRICULTURAL DEPARTMENT, DOMINICA.

F. G. HARCOURT, F.R.H.S.	Agricultural Superintendent & Curator of the Botanic Gardens & Experiment Station.
F. L. SQUIBBS	Asst. Agricultural Officer.
H. B. PIDDUCK, N.D.A., N.D.D.	„ „ „ } Head Quarters „ „ „ } Northern District.
R. A. KITCHING, Dip. Agric. Edin.	„ „ „ in charge of Government Fruit Farm, Copt Hall.
E. E. TAYLOR *	Peasants' Adviser & Officer-in-Charge, Government Marketing Depot.
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G. R. COOLS-LARTIGUE	Clerk, Botanic Station.
A. C. WINSTON	Travelling Agricultural Instructor.
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J. J. McDOWELL	Foreman, Government Fruit Packing Depot.
C. A. ALEXANDER †	Overseer.
G. J. STEDMAN †	Overseer.

* Appointed 28th April, 1931.

† Temporary appointments

STAFF CHANGES.

During the absence of Mr. Harcourt on leave Mr. Squibbs acted as Agricultural Superintendent. Mr. Harcourt returned from England and resumed duty on 23rd October. Mr. Squibbs having been seconded for duty as Assistant Director of Agriculture, Seychelles Islands, left Dominica on December 19th.

LETTER OF TRANSMITTAL.

C. A. 235.

TRINIDAD,

30TH MAY, 1932.

Sir,

I have the honour to transmit the report on the Agricultural Department for the period April to December, 1931.

2. The severe storm of September, 1930, was followed by a long period of unusually dry weather which has retarded the work of the restoration of the Botanic Gardens, and has added greatly to the difficulties of the planters.

3. Mr. Harcourt, Agricultural Superintendent, was absent on leave from 28th March to 23rd October, 1931. Mr. Squibbs acted as Agricultural Superintendent during that period.

4. The completion of the Government Packing Shed and of the Cold Storage Plant have provided the equipment for developing the Fruit Trade. The appointment of Mr. Shill as Marketing Officer for the Leeward and Windward Islands has provided for a degree of supervision and direction of effort and a co-ordination of standard in grading and packing produce for export to Northern Markets which would not have been possible to get in any other way. Mr. Shill who for administrative purposes is attached to the Advisory Department, Imperial College of Tropical Agriculture, has made his headquarters at Dominica.

5. This appointment which is supported by a grant from the Colonial Development Fund is another instance of assistance given to West Indian Agriculturalists in order to help them in these very difficult times.

6. The work of re-establishing the lime industry by planting budded and grafted limes goes on and the extension of the fruit cultivation areas would seem to be provided for by the distribution of plants from the Department's nurseries.

7. All prices have been low and markets dull. Lime oil on which lime growers have depended has been lower than in recent years but, happily, high enough to afford a slight measure of relief from the general depression.

8. Mr. Squibbs who has been seconded for service in the Seychelles Islands will be away from Dominica during the next two years of reconstruction and development work when the island's agriculture will have need of experience and local knowledge on the part of its Department's officers.

I have the honour to be,

Sir,

Your obedient servant,

(sgd.) H. A. BALLOU,
Commissioner of Agriculture.
Imperial College of Tropical Agriculture.

His Honour,

The Administrator,

DOMINICA.

REPORT ON THE AGRICULTURAL DEPARTMENT, DOMINICA.

FOR NINE MONTHS FROM 1ST APRIL TO
31ST DECEMBER, 1931.

WORK IN THE GARDENS AND OBSERVATIONS ON PLANTS.

THE severe drought recorded in the last report extended until the end of May and proved an additional set-back to recovery from the hurricane of September 1930. Much difficulty was experienced in keeping the older damaged specimens alive, as well as those planted in 1930.

During the wet season which followed good progress was made with resuscitation work and a large number of young specimens, including some recent introductions, were planted. The *OREODOXA* and *CARYOTA* avenues were replanted with palms of various species and beds of ornamental shrubs established in different parts of the lawns.

The vitality of the lawn grass was so reduced as to render it necessary to eradicate a heavy growth of resultant weeds before returfing and replanting large portions. Later in the year excessive rains hastened the death of many trees which had apparently begun to recover, these included *OREODOXA REGIA*, *ELAEOCARPUS GANITRUS*, *FICUS ELASTICA*, *ORMOSIA DASYCARPA*, *CASTANOSPERMUM AUSTRALE* and one of three specimens of *LEXDOICEA SECELLARUM*. Otherwise, the gardens have at least superficially regained much of their former beauty.

During the year all the drains have been put in order, fences and gates renovated and painted, a section of the main drive repaired, the stables re-roofed and the cocoa drier restored. A shed was erected to house an Atco motor-mower imported at the end of the year.

In the Economic Plots cocoa trees continue to die out and the most depleted plots have been temporarily converted into citrus nurseries and utilised for trials of cover crops etc. The second of the two fine old Nutmeg plots to be destroyed has been replanted with seedling and grafted nutmegs. The *HYDNOCARPUS* collection has fortunately not suffered much permanent damage, and a few trees have fruited. A specimen of *HYDNOCARPUS ILICIFOLIA* received from Trinidad has been added to the collection.

Specimens of *LECYPHIS ZABUCAJO* fruited sparingly for the first time. The few seeds reaped have been sown.

Much remains to be done in the way of restoration of surviving economic and ornamental species and the re-establishment of some of the devastated plots, sections of the gardens and hill-sides.

WORK IN THE NURSERIES AND DISTRIBUTION OF PLANTS.

Work in the nurseries represented one of the Department's principal efforts during the year, such work being chiefly concentrated on the propagation of budded limes required for the re-habilitation of lime estates which have been virtually destroyed by hurricane and root diseases. Although many large estates have now established their own nurseries, it is left to the Department to supply the majority of plants needed.

Large nurseries are established near Roseau to meet this demand and further new nurseries have been started at Grandbay, Soufriere, Hampstead and Marigot. These new nurseries will not be fully productive until next planting season.

All Citrus plants are budded on the Sour Orange stock, but special orders are filled for budded plants on grapefruit or rough lemon stocks, for planting on soils believed unsuitable to the sour orange.

Such plants, also grafted mangoes and budded avocado pears are sold at a purely nominal price. Care is exercised in supplying plants to planters most likely to profit by them and visits for the purpose of advising on planting, etc., are made as often as expedient.

Young citrus stocks growing in nurseries are estimated to provide 50,000 budded plants in 1932, and sufficient seed has been sown to provide 75,000 selected stocks for 1933. Citrus nursery work on a large scale entails considerable work and supervision and difficul-

PLANT DISTRIBUTION.

ties constantly occur. These difficulties were accentuated by the unprecedented long drought experienced during the early months of the year, which necessitated the hiring of lorries to carry water to nurseries. Further a long spell of wet weather followed the drought and heavy infestations of citrus scab and "damping off" of young seedling stocks was experienced. Heavy and frequent showers of rain made it exceedingly difficult and expensive to keep these diseases under control as the effectiveness of fungicidal sprays was in consequence reduced to a minimum.

In addition to the customary assistance rendered to estates by loaning budders, instruction has been given on the top-working of old seedling mango trees. The variety used as the scion is the "Julie" and the trees mostly converted are known locally as "Mango Long."

The following table shows that there has been a healthy demand for budded citrus, especially limes and that the numbers distributed were greater than in previous years. In 1932 it is anticipated that the supply of budded citrus will again be increased and that the planting community will continue to avail themselves of the facilities offered by the country nurseries. The peasantry are very conservative in realising the importance of substituting budded plants for their own indiscriminately raised seedlings, partly because their present straitened circumstances make the first cost difficult to meet.

There has been a gradual falling off in the demand for cocoa, nutmegs, coconuts and coffee plants.

PLANT DISTRIBUTION.

<i>Name of Plant.</i>	<i>Total for 1927.</i>	<i>Total for 1928.</i>	<i>Total for 1929.</i>	<i>Total for 1930.</i>	<i>Total for 1931.</i>
Washington Navel Orange	1,184	860	768	778	1,427
Budded Oranges (other)	—	—	—	17	78
Grapefruit	1,280	1,529	759	1,633	5,048
Portugal Orange	46	22	22	53	19
Mandarin	23	16	7	13	27
Sweet Lime	20	12	6	36	19
Tangerine	37	14	12	50	9
Seedling Limes	31,610	8,310	300	1,500	—
Bud. & Graft. W.I. Limes	—	1,117	6,182	24,100	26,453
Limes (other varieties)	1,406	1,916	953	767	317
Lemon	—	838	213	1,691	1,246
Sour Orange (Stocks)	1,275	2,012	8,600	2,859	7,550
Coconuts	10,195	12,238	7,489	1,067	1,421
Cocoa	7,860	11,866	12,865	8,384	2,394
Coffee	22,114	30,965	48,037	4,725	16,439
Grafted Mangoes	194	205	288	323	231
Seedling Mangoes	20	54	18	94	58
Nutmeg	4,901	1,555	1,995	1,660	872
Tobacco	4,800	1,482	—	100	—
Mangosteen	248	33	71	8	—
Papaw	514	1,396	284	40	154
Tannias	2,624	6,434	16,362	5,110	1,070
Camphor	313	50	—	—	—
Black Pepper	448	96	—	76	60
Onions	9,100	4,500	—	12,100	28,437
Sugar Cane Cuttings	—	—	26,643	—	—
Miscellaneous	5,908	967	6,076	17,777	21,699
	106,120	88,487	137,950	84,961	115,028

LIME EXPERIMENTS.

PLANT IMPORTATIONS.

Plants introduced during the year were as follows:—*Bougainvillea* spp., *Dipteryx odorata*, *Caryocar nuciferum*, Legume—"St. Vincent, *Cephalostachyum* sp., Tomato var. from Teneriffe, *Aleurites Fordii*, *Piper nigrum* vars.

WORK CONNECTED WITH INSECT AND FUNGUS PESTS AND THEIR CONTROL.

Withertip and Blossom Blight (*GLOEOSPORIUM LIMETTICOLUM*) although still present, appears to be less marked than in previous years, but the wholesale destruction of lime trees by hurricane and Red Root disease (*SPHAEROSTILBE REPENS*) has not permitted experimental evidence of the fact to be obtained.

Collar Rot and kindred diseases have been mainly confined to trees of the seedling lime and seedling sweet orange. Isolated cases have, however, been observed on budded citrus in which cases the trees so affected have been budded low and with soil level very near the bud union.

It has been observed that young grapefruit stocks are occasionally affected by a form of gumming with which is associated a large species of black ant. It is not clear whether the pest or the disease is the primary cause.

Citrus Scab has been very prevalent in citrus nurseries and responsible for heavy losses of stocks, owing to growth being so badly retarded. Sour orange stocks were principally affected.

A leaf spot disease determined at the Imperial College of Tropical Agriculture as *PHYLLLOSTICA* spp. occurred on all kinds of stocks and young budded citrus. The infestations appeared short lived and have not perceptibly checked any but the very young seedlings.

During the year Mr. F. W. Urich, F.E.S., C.M.Z.S., of the Imperial College of Tropical Agriculture, visited Dominica to establish the identity of certain fruit flies which were observed to attack oranges and grapefruit. At the time of Mr. Urich's visit only a few ripe oranges and grapefruit were available for examination and these were found to be unaffected by fruit flies. He, however, discovered that the West Indian fruit fly *ANASTREPHA FRATERCULUS*, a troublesome pest of guavas and other tropical fruits, was breeding extensively in Pomme Rose (*EUGENIA JAMBOS*). This fly has not yet been established, however, as having affected citrus. Other likely host plants were considered to be the Pois Doux (*INGA* spp. and Hog Plum (*SPONDIAS LUTEA*). These trees were not fruiting at the time of Mr. Urich's visit.

In the vicinity of Roseau, Mangoes were found to be heavily infested with *A. FRATERCULUS*, the common species suffering more than the "Julie" variety.

REPORT ON THE LIME EXPERIMENT STATION, DOMINICA.

The conversion of the original seedling lime plots into plots of budded limes and other citrus was outlined last year.

The budded limes in the triplicate series of stock trials A, B and C, each consisting of three plots of limes budded respectively on Sour Orange, Rough Lemon and Grapefruit have grown well and the following cover crops established:—

Series "A"	Horsebeans and Indigofera
„ "B"	„ „ Tephrosia candida
„ "C"	„ „ Pigeon Peas

Further plantings made have included:—

Clean weeded plot	17 Limes budded on Sour Orange
Old Limes „	128 „ „ „ „ „
Jack's Well „	157 „ „ „ „ „

The names of the above plots have been retained for comparison with former years.

The Budded and Grafted Limes planted in 1929 have begun to fruit. There is little difference in the size and health of the trees, though apparently slightly favouring the grafted plants.

DETAILS OF ADMINISTRATION.

The two plots of bearing Grapefruit were so adversely affected by drought that only a comparatively small crop of second rate fruit was produced. The quality of the "Walters" variety was an exception which would seem to indicate its suitability for dry areas.

Young citrus (lemons, grapefruit and oranges) planted last year have come on remarkably well under ordinary cultural treatment including a heavy ground covering of pigeon peas and horse beans.

The bearing budded limes, together with the few remaining seedling trees, yielded a total of 223 barrels of fruit as compared with 574 barrels last year. It is hoped to complete the removal of the rest of the battered seedlings and replant these areas next year.

The plots temporarily utilised for nurseries have been maintained and this work extended to Plots 9 and 10.

In the Coconut plots, several more bearing trees succumbed during the drought. These were dug out, "supplied," and cover crops sown on areas where the trees are still short of their normal complement of foliage. Very few of the old trees have recommenced flowering. The young plants put in totalled 21, viz :—Canal Plot 15, Reigate 1, Tool-Shed plot 1, Range plot 4.

AGRICULTURAL LOAN BOARD.

Many applications for loans during the year were made, but few could be considered owing to the Funds of the Board nearing depletion. Advances to estates already in receipt of loans were continued. It is a matter of concern as to whether these estates, owing to the set backs subsequently received by hurricane and disease, will be restored to a self-supporting basis on the amount of loan originally granted. The hurricanes of 1926, 1928 and 1930 not only called for extraordinary expenditure on estates, but seriously retarded development. The Senior Officers of the Department continued to inspect and report to the Board on allocations of loans made and the progress made by their application.

DETAILS OF ADMINISTRATION.

EXPENDITURE.

The local votes for the Agricultural Department for the nine months were as follows :—

	£	s.	d.
Salaries Curator, Assistant Agricultural Officers, Clerk and Foreman ... }	1,104	0	0
Contingencies ...	10	0	0
Travelling Expenses ...	75	0	0
Maintenance ...	315	0	0
Cultivation Saleable Products, etc. ...	225	0	0
Purchase Special Manures ...	75	0	0
Printing Reports, etc. ...	40	0	0
Experiment Station ...	278	0	0
Upkeep of Horses & Mules ...	23	0	0
Upkeep Morne Bruce Lands & Military Cemetery...	15	0	0
Chemicals & Apparatus ...	19	0	0
Telephone Rental ...	20	0	0
Rent of Quarters for Asst. Agri. Officer ...	23	0	0
Agricultural Instruction ...	327	0	0
	£2,549	0	0

The actual expenditure during the year under the above heads was £2,576. 9. 5.

LABORATORY WORK.

ADDITIONAL EXPENSES FOR SPECIAL SERVICES.

Grant for distribution of economic plants £2,250.

R E C E I P T S .

						£	s.	d.
Limes	...	...	...	...	...	186	10	9½
Cocoa	...	...	...	...	...	24	1	1
Plants	...	...	...	...	...	266	17	10
Fruit	...	...	...	...	...	7	11	0½
Onion Seed	...	...	...	...	...	1	5	6
Vegetable Seed	...	...	...	...	...	7	6	3
Miscellaneous	...	...	...	...	...	6	8	4
Laboratory Receipts	...	...	...	...	...	27	8	6
						£527	9	4

REPAIRS TO BUILDINGS, ETC.

No repairs or extensions to buildings were made during the nine months under review.

CORRESPONDENCE AND DISTRIBUTION OF INFORMATION ON AGRICULTURAL MATTERS.

Six hundred and seventeen letters were despatched and four hundred and eighty-six Minute Papers dealt with, in addition to numerous Confidential and Loan Board Minute Papers. Over seven hundred bills were despatched during the nine months. Various pamphlets and copies of reports were distributed to planters interested.

PLANT AND SEED EXCHANGE.

Contributions of plants and seeds were gratefully received from the following:—Imperial College of Tropical Agriculture, Trinidad; Director of Agriculture, Demerara; Royal Botanic Gardens, Kew; Drew Brown Limited, Canada; Agricultural Superintendent, Grenada; Agricultural Superintendent, St. Vincent.

Budwood, Seeds and Plants were sent to:—Imperial College of Tropical Agriculture, Trinidad; United States Department of Agriculture, St. Thomas; United States Department of Agriculture, St. Croix; Department of Agriculture, Vancouver; Agricultural Department Nigeria; U.S.S.R. Institute of Plant Industry, Leningrad; Agricultural Superintendent, St. Lucia; Director of Agriculture, Demerara; Curator, Montserrat; Agricultural Superintendent, Antigua.

VISITS TO THE DEPARTMENT, ETC.

His Excellency, Lt.-Col. T. R. St. Johnston, K.C.M.G., Governor of the Leeward Islands, G. Evans, Esq., C.I.E., M.A., Principal of the Imperial College, Trinidad; Dr. S. C. Harland, Geneticist, Cotton Research Station; G. A. Jones, Esq., Dip. Agri., Asst. Commissioner (paid several visits); E. A. McCallan, Esq., Director of Agriculture, Bermuda; Major R. L. Wheeler, Transport Specialist, Canada; L. S. Glass, Esq., Trade Commissioner, Eastern Group B.W.I.; Sir Sydney Armitage-Smith, K.B.E., C.B.; R. E. Montgomery, Esq., Adviser on Animal Health; H. C. Collier, Esq., Secretary, Canadian-West Indian League; W. Letovsky, Esq., Secretary, Canadian-West Indies Produce Co., Prof. F. W. Urich, Imperial Dept. of Agriculture, Trinidad; Messrs. Kisluik & Cooley, U.S.A. Department of Entomology; L. McCutcheon, Esq., General Agent, Canadian National Steamships, and Professor H. A. Ballou, Commissioner of Agriculture for the West Indies.

LABORATORY WORK.

The following tests were made during the nine months:—

Raw Lime Juice	....	....	8
Concentrated Lime Juice	....	....	—
Bay Oil	....	....	361
Lime Oil	....	....	2
Milk	....	....	20

VISITS TO ESTATES AND AGRICULTURAL INSTRUCTION.

The Senior officers and members of the permanent establishment have between them visited practically every estate of importance in the island and also a large number of small holdings. The kind hospitality accorded to officers travelling has been much appreciated, especially in those parts of the island which are reached only with difficulty under adverse weather conditions.

The pupils in training at the Department's headquarters have been given the usual theoretical and practical work, the latter predominating. Five third-year youths are now in charge of the country nurseries, while others are senior propagators in the various nurseries in the vicinity of Roseau. The best budders have continued to assist some of the estate nurseries.

All round the island the Boys' Government Schools were supplied with sour orange stocks for budding. Visits of instruction in propagation and general garden management were paid from time to time, with the result that Head Teachers have come to regard school gardening as a vital part of the curriculum.

It is an important duty of travelling officers to follow up plants distributed by the Department, and to advise on their care.

NORTHERN DISTRICT.

An Assistant Agricultural Officer having been stationed in the Northern District attempts were first made to deal as quickly as possible with outstanding Loan Board work, make contact with the leading estates and small holdings, and as a result to organise as experience demanded. The peripatetic work is considerable in this extensive district composed largely of peasantry.

Some 3½ acres of new nurseries at Hampstead and Marigot, together with the existing Cabrits nursery are now providing budded lime plants for this district, although appeal has had to be made to Roseau for lemons, grapefruit and other plants. The sour orange stock is believed to be unsatisfactory for the greater part of the district and most of the plants have been budded on rough lemon and some on grapefruit. The problem of the best stock is engaging the attention of the leading estates in conjunction with the department.

Young men are being taught budding, etc., at all three nurseries with the senior acting as an overseer and assistant instructor. They have rendered assistance to schools and estate nurseries, the results in the Lasoye district being particularly satisfactory. Ten School Gardens are periodically visited for instructional purposes. Public Meetings have been held at Marigot, Wesley, Colihaut, Vieille Case and Portsmouth, and impromptu "chats" at smaller centres.

Milk Testing has confirmed the opinion that the unsatisfactory state of the milk supply, in country districts at least, is partly attributable to ignorance and superstition. The addition of water, however, has been followed by prosecution and fines in all cases except one.

Other investigations have been made in conjunction with the work of Headquarters staff and six visits were made to Headquarters by the Assistant Agricultural Officer.

A Prize Holdings Competition was commenced in August at and around Marigot and Wesley. Nineteen proprietors of the right type entered, but only fifteen holdings were finally accepted as of sufficient initial merit. The entrants are being encouraged to replant and improve permanent cultivations, especially limes, coffee and coconuts. They will probably be judged in 1932.

The first Agricultural Show held at Portsmouth on November 27th was most encouraging. The Committee's Report, under the Chairmanship of the district officer, was published in the *Official Gazette* of December 14th (No. 56 of 1931). The exhibits were mainly competitive amongst small holders, but the planters and Headquarters staff each had a stand of an educative nature. His Honour W.A. Bowring, C.B.E., Administrator, opened the Show in the capacious Convent School building and grounds.

THE LIME INDUSTRY.

SOUTHERN & EASTERN DISTRICTS.

The Travelling Agricultural Instructor continuously travels the Southern and Eastern Districts following up plants distributed and advising peasants generally on their cultivations. His itinerary is approximately as follows and represents weekly tours :—

- 1 Roseau District, Roseau Valley etc.
- 2 „ „ (North) to Macoucherie Village
- 3 „ „ (South) Giraudel and Pte. Michel
- 4 Grand Bay District
- 5 Soufriere „
- 6 Eastern „

THE LIME INDUSTRY.

The lime crop actually shipped in 1931 dropped to an even lower level than was anticipated. While this has been largely attributable to disease and hurricanes, the demand for lime products, the majority of which are exported to the United States of America, has also fallen off badly and the collapse of the market for concentrated lime juice has at least temporarily converted this section of the industry into a minor one, with distilled oil and green limes as the major products.

The seriousness of the situation may be emphasized by the fact that a few years ago from 66% to 70% of the crop was disposed of in the form of concentrated juice, whereas to-day planters are compelled to carry large stocks or throw away the juice after distillation of the oil.

Fortunately the prices of other lime products have been maintained at a remunerative and at times a high level, but the estimated total value of all lime products has reached only £42,307 as compared with £91,689 in 1930 and £176,000 in 1921.

This critical state of Dominica's staple industry has been brought about by a series of disasters; hurricanes and root diseases being in the main responsible. Estates have been devastated through these causes and planters are now faced with the expensive necessity of replanting their fields with limes budded on hurricane and disease resisting stocks. This work is being carried out with commendable rapidity and the earlier plantings are now commencing to fruit. Approximately 58,000 budded limes have been distributed to growers during the past four years.

Attempts to extend the green lime trade to the United Kingdom and Canada have for many years met with disappointing results, largely owing to the fact that the lime is but little known in these countries. With the excellent service instituted by the Canadian National Steamships, recent attempts to popularise the lime in Canada have been more encouraging. Trial shipments of fruit supplied by planters and the Experiment Station have resulted in small orders this year and efforts are being made in this and other ways to supplement the trade now mainly negotiated with the United States of America.

The following table gives the crop shipped since 1921, calculated in barrels of fruit and expressed in round numbers, and will illustrate the decline of the seedling lime industry through a series of disease and hurricane causes.

Years.			Barrels.	
1921	..	..	516,000	Prior to appearance of Withertip.
1922	..	..	400,000	
1923	..	..	228,000	
1924	..	..	424,000	Includes carry over from 1923.
1925	..	..	230,000	
1926	..	..	214,000	Appearance of Red Root.
1927	..	..	210,000	
1928	..	..	205,000	Hurricane September 12th.
1929	..	..	133,000	
1930	..	..	114,000	Hurricane September 1st.
1931	..	..	30,000	

THE LIME INDUSTRY.

The following table calculated on the usual basis shows the disposal of the crop under various heads during 1931.

<i>Products.</i>	<i>Barrels of Fruit.</i>	<i>Approximate percentage of total crop.</i>
Concentrated lime juice..	4,817	15.87
Raw Juice	12,434	40.97
Fresh Limes	11,014	36.29
Pickled Limes	305	1.00
Lime Juice Cordial ...	1,782	5.87

50 gallons of con. juice represent 75 brls. of lime fruits: 7½ gallons of raw juice represent 1 brl. of lime fruits: 1 ton of citrate of lime is equivalent to 226 brls. of lime fruits: 1 ton of citric acid is equivalent to 400 brls. of lime fruits: 1 gallon of lime juice cordial represents 5½ brls. of lime fruits.

The exports of products of the lime industry during 1931 is recorded below :—

<i>Products.</i>	<i>Quantity.</i>	<i>Value. £</i>
Concentrated Lime Juice.	3,211 gallons	241
Raw Lime Juice	93,255 „	2,331
Lime Juice Cordial ...	324 „	52
Fresh Limes	11,014 barrels	13,503
Pickled Limes	305 „	221
Essential Oil (Distilled)..	14,446 lbs.	20,284
Otto of Limes (Hand-pressed or ecuelled).	2,158 „	4,612
Oils in solution in Raw Juice exported ...	783 „	1,063
		£42,307

LIME HYBRIDS.

Eighteen Lime Hybrids highly resistant to Withertip and most resembling the West Indian lime have been crossed-back with the West Indian as male parent. The number of seedlings raised in boxes from the back-crosses is recorded in the table below, in which the female parent of the original cross is mentioned first :—

<i>Original Crosses.</i>	<i>Number crossed back.</i>	<i>Seedlings raised.</i>
Woglum Lime X West Indian	6	98
West Indian X Woglum Lime	5	12
Citrus Aurantifolia X West Indian	7	93
(<i>Philippine lime</i>)	18 parents.	203 Seedlings.

Several of the original hybrids have yielded fruit of a disappointing appearance, but a few with foliage similar to the West Indian lime have still to fruit. One of these (No. 29 Woglum hybrid) set a single fruit very similar to the W.I. Lime in appearance, and together with others has already been reproduced by budding in order to have available planting material if so desired.

LEGISLATION AFFECTING CROPS.

MINOR INDUSTRIES.

The continued depression of the markets for cocoa, coffee, copra, bay oil and vanilla has seriously limited the export of these commodities.

Cocoa and Coconut plantations have made good recovery from the set back they received from the hurricane of September, 1930, and exports may be expected to increase as marketing facilities and prices improve.

Much improvement has been made in the production of oranges, grapefruit and mangoes. The crop was produced almost entirely from comparatively old trees brought into a higher condition of productivity despite hurricane injury. There was an abnormally poor market for early grapefruit which was principally of the "Triumph" variety. Marsh's Seedless, Duncan and Foster are the varieties now being planted.

Dominica oranges were in good demand and realised satisfactory prices.

Rum has in the past been distilled almost entirely for local consumption, but efforts were made during the year to establish a trade with the neighbouring islands and 1,380 gallons were exported. A number of estates and peasant proprietors have contributed towards the necessary production of sugar cane and one new distillery has been opened. Production has been somewhat in excess of the demand with the result that the price of syrup fell to 10d. a gallon in December, though this was partly due to poor quality at that time.

Several estates have become interested in the growing of vegetables and in order to assist growers who wished to explore the possibilities of the Canadian winter market, the Department obtained supplies of seeds at wholesale rates and distributed at half cost. Small trial plots were planted by the Department for testing out varieties, but early plantings were adversely affected by heavy rains and proved a failure. Further plantings of tomatoes have been made and show better promise.

LEGISLATION AFFECTING CROPS.

In 1898 a Law was passed with a view to the prevention of the importation of articles likely to introduce diseases of plants, since which time further legislation has been enacted with reference to specific diseases and insect pests. A summary of Laws, Orders and Proclamations then in force was given in the report for 1929-30. These have now been revised, simplified and collected under one Proclamation dated February 5th 1931, and the earlier proclamations rescinded accordingly.

The provisions of such of the above as require the examination and/or fumigation of planting material not absolutely prohibited from entry are carried into effect by the agricultural officers on notification by the Treasurer and Comptroller of Customs.

With regard to the exportation of plants, certificates of inspection are issued in accordance with the requirements of the country of destination.

The most important of the laws relating to the export of products concerns the exportation of fruit. Under the Principal Act of 1929, Statutory Rules and Orders No. 17 of 1931 were expressly designed for the further improvement of the quality, grading, wrapping and packing of citrus and other fruits. The Officer-in-Charge of the Government Marketing Depot is the Chief Fruit Inspector under these Orders, which rescind other recent Statutory Rules and Orders. He is also an Examiner of Vanilla, and Secretary of the Fruit Trade Committee.

CHIEF EXPORTS.

CHIEF EXPORTS.

TABLE OF AGRICULTURAL EXPORTS FOR THE TRIENNIAL PERIOD
1929 TO 1931.

	1929.	1930.	1931.
<i>Lime Products:</i>			
Concentrated Juice ...	35,446 galls.	45,832 gal's.	3,211 galls.
Raw Juice ...	475,102 „	195,994 „	93,255 „
Lime Juice Cordial ...	20 „	201 „	324 „
Distilled Oil ...	30,894 lbs.	25,577 lbs	14,446 lbs.
Ecuelled Oil ...	5,256 „	1,551 „	2,158 „
Green Limes ...	16,476 brls.	17,461 brls.	11,014 brls.
Pickled Limes ...	67 casks	82 casks	123 „
<i>Cocoa Products:</i>			
Cocoa, Raw ...	275,145 lbs.	409,536 lbs.	218,773 lbs.
Cocoa, Prepared ...	434 „	36 „	57 „
<i>Coffee Products:</i>			
Coffee ...	152 lbs.	383 lbs.	87 lbs.
<i>Coconut Products:</i>			
Coconuts ...	63,662	96,802	50,355
Copra ...	57,223 lbs.	113,831 lbs.	45,526 lbs.
<i>Sugar Products:</i>			
Rum ...	252 galls.	68 galls.	1,380 galls.
Syrup ...	—	—	—
<i>Spices:</i>			
Vanilla ...	3,650 lbs.	7,678 lbs	144 lbs
Nutmeg ...	£8	£3	—
Ginger ...	£213	£108	£20
<i>Honey Products:</i>			
Honey ...	1,080 lbs.	126 lbs	620 lbs.
Bees Wax ...	93 „	—	—
<i>Various Products:</i>			
Bananas ...	448 bunches	2,453 bunches	1,556 bunches
Oranges ...	837 brls.	339 brls.	1,757 brls.
Mangoes ...	5,309 crates	3,363 crates	4,006 crates
Grapefruit ...	1,248 „	917 „	1,531 „
Pears ...	£1,568	£454	670 „
Miscellaneous fruits ...	£375	£1	£47 „
Bay Oil ...	18,349 lbs.	15,948 lbs.	17,783 lbs.
Orange Oil ...	1,116 „	2,835 „	830 „
Kola Nuts ...	—	—	—
Tamarinds ...	36 brls.	39 brls.	4 brl.
Vegetables ...	£20	£120	£129
Farine ...	£18	£4	£1
Hides & Skins ...	£52	£38	—
Leather Unmanufactured.	2,231 lbs.	£137	£31
Plants, Seeds & Bulbs ...	£2	£4	£1
Fruits, Jams & Jellies ...	£10	£4	£2
Turtle Shells ...	242 lbs.	168 lbs.	388 lbs.
Baskets ...	£1	5/-	—
<i>Forest Products:</i>			
Hardwood ...	47,150 feet	38,822 feet	20,840 feet
Firewood ...	538 cords	298 cords	22 cords
Canoe Shells ...	64	£57	£39
Shingles ...	£3	£6	£2
Charcoal ...	5,021 lbs.	£1	£1
Locally made boats ...	£53	£33	£25
Total Values ...	£172,303	£109,059	£68,938

METEOROLOGICAL REGISTER.

METEOROLOGICAL REGISTER KEPT AT BOTANIC GARDENS, DOMINICA.

Year. 1931.	THERMOMETER.				Relative Humidity.		Thermometer.		Barometer Corrected. <i>Reduced to 32° Fh. Sea Level.</i>		Rainfall.	Barometer Corrected.		Thermometer.		REMARKS.
	Dry.		Wet.													
	Months.	9 a.m.	3 p.m.	9 a.m.	3 p.m.	9 a.m.	3 p.m.	Max'm.	Min'm.	9 a.m.	3 p.m.		Highest.	Lowest.	Highest Maximum.		Lowest. Minimum.
January ...	79	82	72	74	70	63	80	68	30.00	29.92	1.47	30.07	29.87	91	65	
February ...	80	83	72	72	65	52	88	69	29.97	29.89	1.05	30.04	29.81	93	66	
March ...	84	87	74	75	58	57	92	70	30.00	29.91	.59	30.08	29.88	95	67	
April ...	85	86	75	77	60	60	92	72	29.96	29.89	.51	30.05	29.82	96	68	
May ...	86	87	77	78	61	60	94	75	29.95	29.89	1.70	30.01	29.83	97	71	
June ...	83	86	77	78	71	65	90	75	29.99	29.94	9.98	30.04	29.84	94	72	
July ...	83	85	78	79	78	72	88	74	29.95	29.91	18.45	30.05	29.84	92	71	
August ...	82	85	77	79	77	72	89	74	30.00	29.93	17.44	30.05	29.85	93	71	
September ...	83	85	78	78	74	68	90	74	29.94	29.86	13.51	30.08	29.77	92	72	
October ...	82	85	78	78	79	71	89	73	29.94	29.86	9.71	30.00	29.82	92	71	
November ...	80	83	76	76	81	66	87	73	29.89	29.82	11.90	29.96	29.73	89	70	
December ...	78	80	74	74	80	75	84	70	30.00	29.92	7.56	30.05	29.87	86	67	
ANNUAL 1931	82	84	76	76	71	65	89	72	29.96	29.89	7.82	30.04	29.83	92	69	

Highest Maximum Temperature = 97° on May 21st.

Lowest Minimum Temperature = 65° on January 24, 28, 29, 30, 31.

,, Barometer (Corrected) = 30.08 ,, March 13th

,, Barometer (Corrected) = 29.73 ,, November 17th.

Greatest Rainfall in 24 hours = 5.40 ,, August 16th.

METEOROLOGICAL REGISTER.

RAINFALL AT THE BOTANIC STATION, DOMINICA, 1912-1931.

Month.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	Monthly Mean Rainfall.
January ...	8.21	7.48	3.22	1.76	10.79	5.00	6.02	2.42	7.54	6.82	6.50	3.82	6.25	7.88	3.68	5.50	6.60	5.18	10.65	1.47	5.84
February ..	1.32	2.32	5.56	1.04	1.90	4.10	8.73	1.52	4.76	1.02	4.30	2.30	1.90	1.95	2.46	4.50	4.25	3.13	2.07	1.05	3.01
March ...	4.60	7.29	2.23	0.84	4.52	6.74	3.32	0.69	3.80	4.46	2.80	3.46	0.66	3.50	.96	5.37	6.30	7.36	3.89	.59	3.67
April ...	3.38	1.57	6.45	15.75	1.22	0.47	1.86	2.36	.22	3.06	2.26	3.77	1.46	.40	2.77	4.67	4.16	1.27	5.01	.51	3.13
May ...	1.56	3.46	2.58	3.65	2.05	2.94	5.90	4.60	2.38	1.54	2.64	0.13	3.18	2.76	2.44	6.69	2.25	2.80	2.21	1.70	2.89
June ...	5.44	3.49	7.27	9.17	4.82	15.34	6.04	3.88	3.48	1.96	7.14	4.18	4.42	5.80	5.76	15.03	6.68	10.87	7.32	9.98	6.90
July ...	5.83	7.57	11.83	14.84	8.23	13.70	11.28	12.64	12.08	11.18	6.08	8.20	13.64	6.25	10.14	9.61	6.58	13.13	7.90	18.45	10.46
August ...	4.88	10.93	3.98	14.74	16.58	8.53	8.46	9.64	8.73	9.30	9.26	11.44	11.28	13.88	10.10	4.65	12.80	12.55	6.76	17.44	10.29
September.	3.32	8.39	7.71	11.36	6.20	15.02	4.14	7.06	8.60	6.28	10.68	4.28	4.88	9.12	4.12	6.20	8.10	5.63	14.66	13.51	7.96
October ...	7.26	10.40	5.13	8.41	10.06	2.46	6.67	7.50	12.60	9.41	2.68	9.84	10.98	12.55	5.86	8.84	4.35	12.19	3.15	9.71	8.00
November.	11.20	4.28	9.44	10.05	14.28	1.92	3.36	9.02	4.62	2.44	3.00	1.06	6.86	9.60	7.54	8.70	7.93	14.39	5.51	11.90	7.35
December.	6.66	2.72	9.70	8.40	3.77	4.58	5.86	6.70	5.62	4.22	6.90	1.92	13.65	2.02	3.75	1.37	5.38	8.48	3.66	7.56	5.65
Total ...	63.72	69.90	75.10	100.01	83.42	80.80	71.46	68.03	74.46	61.72	64.24	54.40	79.16	75.69	59.58	81.13	75.38	96.98	72.79	93.87	75.15

Average year = 75.15 inches.

GOVERNMENT MARKETING DEPOT.

GOVERNMENT MARKETING DEPOT.

The Government Marketing Dépôt comprises what were formerly known as the Government Trade Agency and the Peasants' Information Bureau, and the Officer-in-Charge is styled the Government Marketing Officer. Statements are appended showing the amount and value of fruit and other produce dealt with at the Dépôt.

During the year Mr. A. C. Shill was appointed Marketing Officer for the Leeward and Windward Islands and established his headquarters in Dominica, his office being in the same block as the Dépôt. Mr. Shill's duties are of an advisory nature and his work is intended to facilitate the co-ordination of effort in these two groups of Islands to ensure as far as possible uniformity in the grades of fruit and vegetables exported, and to improve these grades in conformity with the high-class demands of present day markets.

Agents' reports received from London, Halifax and St. John advised that there was practically no wastage in shipments of oranges and grapefruit, and satisfaction was expressed with regard to flavour and juice content of the fruit; also the grading and general appearance of the pack. The only criticism received was concerning skin blemishes on the fruit, which militated against higher prices being obtained.

Shipments of Julie Mangoes and Avocado Pears to Canada did not realise remunerative prices, the difficulty lying in the fact that these fruits appear to be but little known in Canada.

The prices obtained for trial shipments of early vegetables to Canada were not altogether satisfactory, but improvement is expected with later shipments *i.e.* during the months of February, March and April.

Citrus Packing House Machinery, the property of the "Carribean Plantations Limited" was installed during the months of September and October and facilitate considerably the preparation of the fruit for the market. Most of the Navel oranges exported by this Company were artificially coloured which considerably improved the appearance of the fruit.

During the year a Cold Storage and Ice Making Plant was installed in a section of the Marketing Dépôt Building. The pre-cooled chambers are proving a boon to the fruit industry inasmuch as packing operations may be continually in operation during the fruit season and fruit stored in these chambers pending the arrival of steamers, or even for a longer period if an improvement in market prices is anticipated.

The Peasants' Information Bureau section of the Marketing Dépôt exported very little Peasants' produce during the year. This was anticipated, owing to the severe hurricane of September 1930 destroying the greater part of the Peasants' cultivations. World wide trade depression was also to some extent responsible, the Peasants preferring ready cash transactions with local middlemen rather than running the risk of losses through shipping overseas. The Peasants were helped to get in touch with responsible local buyers. Weekly Market Reports quoting the local prices obtainable were posted outside country police stations and published in the local press. Steamship itineraries were also circulated to keep the Peasants informed of shipping opportunities.

GOVERNMENT MARKETING DEPOT.

STATEMENT OF PRODUCE DEALT WITH BY THE PEASANTS' INFORMATION BUREAU FOR THE PERIOD 1ST APRIL, 1931, TO 31ST DECEMBER, 1931.

<i>Produce.</i>	<i>Quantity.</i>	<i>Estimated Local Value.</i>
Vanilla	98 lbs.	£19. 12. 0.
Bay Oil	160 ,,	24. 0. 0.
Total		£43. 12. 0.

STATEMENT OF FRUIT AND VEGETABLES PACKED IN THE GOVERNMENT PACKING DEPOT FOR THE PERIOD 1ST APRIL, 1931, TO 31ST DECEMBER, 1931.

<i>Produce.</i>	<i>Quantity.</i>	<i>Estimated Local Value.</i>
Grapefruit	1,359 crates	£271. 16. 0
Oranges	2,450 ,,	735. 0. 0
Lemons	50 ,,	15. 0. 0
Limes	663 ,,	132. 12. 0
Mango (Julie)	282 ,,	42. 6. 0
Mango (Local)	971 ,,	145. 13. 0
Avocado Pears	665 ,,	99. 15. 0
Pineapples	3 ,,	9. 0
Tangerines	7 ,,	14. 0
Shaddocks	2 ,,	6. 0
Vegetables	132 ,,	26. 8. 0
		£1,469. 19. 0

STATEMENT OF FRUIT AND VEGETABLES MARKETED BY THE GOVERNMENT MARKETING DEPOT FOR THE PERIOD 1ST APRIL, 1931, TO 31ST. DECEMBER, 1931.

<i>Produce.</i>	<i>Quantity.</i>	<i>Estimated Local Value.</i>
Grapefruit	246 crates	£ 49. 4. 0
Oranges	1,991 ,,	597. 6. 0
Lemons	48 ,,	14. 8. 0
Limes	226 ,,	45. 4. 0
Mango (Julie)	232 ,,	34. 16. 0
Mango (Local)	216 ,,	32. 8. 0
Avocado Pears	150 ,,	22. 10. 0
Vegetables	63 ,,	12. 12. 0
		£808. 8. 0

Cold Storage Charges and Sale of Ice from 1st November to 31st. December, 1931, amounted to :—

Total receipts for Ice-sales	=	£29. 19. 6
„ „ „ Cold Storage	=	£17. 7. 8

GOVERNMENT FRUIT FARM—LAND SETTLEMENT SCHEME.

GOVERNMENT FRUIT FARM AND LAND SETTLEMENT SCHEME
AT COPT HALL ESTATE.

Good progress has been made in the development of a virtually abandoned estate into a Fruit Farm, which it is intended should be later morselled out and sold on easy terms to intelligent local men who would like to engage in Agriculture, but are prevented from so doing owing to lack of capital to meet the initial cost of the land and the expense of cultivating permanent crops until same come into bearing.

The general scheme was outlined in last year's report.

Demonstration Plots. Approximately 20 acres of land is being reserved for the use of the Agricultural Department for demonstration, experiment and nursery work. Of this section 17 acres of land have been cleared and drained, 12 acres of which have been planted in grapefruit, oranges and mandarins for varietal and stock trials. Lemon grass, Guatamala grass and Guinea grass have been planted to provide mulching material. Cover crops of Tephrosia, Crotonaria, Canavalia and Pigeon Peas are grown for demonstration purposes.

Estate Development. The estate in general will be divided into five-acre plots, each plot to be planted as follows:—

2½ acres	Grapefruit (¾ of plot Marsh's Seedless & ¼ Duncan)
2 ,,	Oranges (¾ of plot Washington Navel & ¼ Valencia)
½ ,,	Miscellaneous fruits.

Twenty-five acres of land have been cleared and drained, of which 15 acres, comprising 12 acres of grapefruit and 3 acres of oranges have been planted. Cover and mulch crops, similar to those growing in the Demonstration plots have also been planted.

Estate Nursery Work. This work was difficult owing to heavy infestations of citrus scab. Heavy rains make effective control difficult if not impossible, and a subsidiary nursery to provide plants for the estate will be established on drier lands belonging to the Department. The estate nursery provided 300 budded grapefruit and 400 budded oranges.

Rainfall. Records were only obtainable from the month of June, and are as follows:—

June	..	..	..	17.04	inches
July	..	..	..	23.91	,,
August	..	..	..	23.46	,,
September	..	..	..	17.09	,,
October	..	..	..	15.97	,,
November	..	..	..	16.67	,,
December	..	..	..	12.60	,,
Total	..	..	..	125.74	,,

General A house was put in good order for occupation by the overseer, and a store-room and watchman's house were built. A donkey and cart were purchased.

STATEMENT OF EXPENDITURE.

Demonstration plots	....	....	....	£264.	16.	8
Estate plots	....	....	....	262.	5.	9
Nursery	....	....	....	59.	11.	11
Other Charges, etc.	....	....	....	87.	2.	7
Total	....	....	....	£673.	16.	11

The sum of £10. 1. 6 was received for the sale of catch crops and firewood.

RAINFALL RETURNS, DOMINICA.

RAINFALL RETURNS, DOMINICA, 1931.

STATIONS.	JAN.	FEB.	MARCH.	APRIL.	MAY.	JUNE.	JULY.	AUGUST.	SEPT.	OCTOBER.	NOV.	DEC.	TOTALS.
1. Batalie	.28	.00	.40	1.05	1.65	5.15	10.94	14.30	10.01	5.34	7.24	4.52	60.88
2. Botanic Gardens	1.47	1.05	.59	.51	1.70	9.98	18.45	17.44	13.51	9.71	11.90	7.56	93.87
3. Canefield	.72	1.38	.32	1.56	2.33	11.63	17.96	16.76	5.32	9.15	10.61	7.50	92.04
4. Castle Bruce	8.63	7.00	4.23	7.53	10.01	16.98	14.34	17.02	19.58	17.80	20.19	9.94	153.25
5. Clark Hall	1.90	.44	.91	4.61	3.56	13.35	16.00	13.28	10.97	10.86	9.29	8.41	93.68
6. Governor	6.95	5.46	6.18	6.77	8.55	14.20	14.35	17.46	11.84	11.76	24.16	9.45	137.07
7. Hampstead	5.48	3.16	2.47	3.58	4.58	12.42	8.22	13.85	9.15	9.72	14.08	5.62	92.33
8. Londonderry	3.04	2.00	2.27	2.50	3.10	5.06	6.90	7.33	11.01	8.29	9.30	9.57	70.37
9. Morne Bruce	2.98	1.35	.80	.62	2.26	11.98	18.76	18.79	14.14	10.56	12.88	8.40	103.52
10. Moore Park	5.68	3.33	2.43	4.74	8.98	11.55	10.04	16.81	13.08	9.33	14.78	8.07	108.07
11. Picard	4.13	1.73	2.40	3.69	5.93	11.74	13.98	17.57	11.59	7.38	9.39	11.84	101.17
12. Pte. Mulâtre	5.06	2.90	4.28	6.04	5.80	10.38	14.15	19.84	16.09	9.26	14.10	13.82	121.72
13. Rosalie	6.60	6.04	3.95	7.35	9.11	16.89	13.43	16.20	17.85	16.08	18.91	9.49	141.90
14. Shawford	17.17	5.26	1.18	7.69	7.82	33.51	32.75	37.29	38.80	39.20	29.14	36.92	286.73
15. Sherwood	8.27	5.20	2.41	8.92	6.03	18.84	26.80	28.63	19.87	20.63	24.34	17.79	187.73
16. Stowe	5.08	3.16	3.34	4.67	7.91	14.37	14.89	18.27	13.09	10.74	17.69	12.46	125.67

Mean Rainfall 16 Stations ... 123.13 inches.

6 Leeward Stations...

5 Windward

2 Inland

3 Lasoye

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